

Estimated Impact of 2001 Drought on Agriculture in Nova Scotia

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Table of Contents

Executive Summary	page 1
Background	page 4
Method of Accessing the Impact of Weather on Agriculture	page 4
Weather Summary	page 4
The Impact of Drought on Agriculture	page 6
Farm Income Forecast	page 8
Program Participation Trends as a Measure of Addressing Economic Hardships Incurred from the Drought	page 10
Analysis and Recommendations	page 10
Appendix I	page 16
Appendix II	page 17
Appendix III	page 19
Appendix IV	page 25
Appendix V	page 27



EXECUTIVE SUMMARY

Drought conditions have had an adverse effect on many farm sectors in 2001. The following report is a synopsis of the estimated impact on agriculture based on a variety of anecdotal reports and proxy measures. The report estimates drought damage. The final impact may not be known until well into the 2002 cropping season.

Most areas affected by drought in 2001 received less rain in July and August than the previous four years. The impact on agriculture is best described as "variable" and is concentrated within regions and sub sectors. Crop yields in many parts of the province are expected to be well below average. Although individual farms have suffered from the drought throughout the Province, Annapolis, Kings, Cumberland, Colchester, Antigonish and parts of Pictou County are the most affected regions. Hants County, Pictou County, Halifax Regional Municipality and parts of Cape Breton Island were somewhat less impacted. Although drought impact was somewhat mitigated by irrigation, it resulted in significant increases in production costs.

The crops that suffered the most from drought are potatoes in the Annapolis Valley,

soft fruits such as blueberries in Cumberland and parts of Colchester counties (Great Village area), and vegetables in Kings and Annapolis counties.

Livestock is being sold at lighter market weight because of poor pasture conditions, inadequate water and feed. Production costs increased for most livestock producers due to mitigative actions to address the drought. Although forage production is down by about 20% throughout the Province, eastern Nova Scotia, particularly Antigonish county, appears to be most affected. However, this forage situation may be a combination of drought and army worm damage.

The Nova Scotia Federation of Agriculture (NSFA) prepared a report on the impact of the 2001 drought, "*Compendium of Information regarding Drought 2001*", which it shared with the Department on November 16, 2001. The federation's report has been incorporated into this document. The major areas of weather-related impact were found to be consistent with the Department's findings and reported substantively comparable results both regionally and by sector.

The NSFA report proposes a number of short and longer term program options. The NSFA options and the Province's response follow:

Program Options (short term)

1. *The Province should cover negative margins for CFIP.*

The Province will:

- provide CFIP negative margin coverage for the 2001 claim year.

2. *The Province should provide direct assistance to producers who suffered crop losses where the crop was uninsurable through crop insurance.*

The Province will:

- consider expansion of the Crop Insurance Programs to include additional crops.

3. *The Province should make low interest loans to eligible producers to replace lost infrastructure, cover increased production costs, reorganize farm businesses and refinance debt.*

The Province will:

- encourage the federal government to continue to offer its fall and spring cash advance program.
- continue to offer the agriculture industry competitive loans through the NS Farm Loan Board.
- work with individuals who have faced financial hardship as a result of the drought to address "cash-flow" stresses.
- encourage farmers to make use of the Farm Consultation Service and Farm Debt Mediation Service. These federal programs are designed to deal with "cash flow" problems.

4. *The Province should provide up to 50% assistance to rehabilitate land and infrastructure damaged by weather conditions.*

The Province will:

- place increased emphasis on its farm and public protection programs (e.g. Farm Investment Fund) which includes environmental and water management.

Program Options (long term)

1. *The Province should set up a formal consultation process on safety nets with the Federation and agree to take a more aggressive approach at the national level with respect to the negotiation of safety net programs that fit Nova Scotia's needs.*

The Province will:

- continue to work with industry on the design and evaluation of present and future safety net programs.
 - continue to support existing safety net programs and increase participation through promotion and awareness.
 - explore options within existing safety net programs to address farm income disasters within the Canada/Nova Scotia Agricultural Framework Agreement.
 - work to ensure that the next Agricultural Framework Agreement includes the ability to address long term water solutions for Nova Scotia.
2. *The Province, in consultation with the industry, should immediately begin work on the development of a water management strategy for agriculture.*

The Province is:

- working with industry, through such structures as the Growers Water Group, to ensure that the short and long term water resource challenges facing agriculture are considered in provincial water management strategies.
 - working to address the specific water management needs of agriculture, under the leadership of a Department Water Task Group recently created by the Department.
3. *The Province should make an effort to look at future climate change and its implications for agriculture in Nova Scotia as a preliminary step to reorganizing the industry to deal with future weather patterns.*

The Province will:

- address climate change through adaptation and renewal programs.
- further study the interaction between agriculture and weather in Nova Scotia through the Climate Change Research Chair at the NSAC.

- increase predictive climatological research to better estimate the future impact of weather on agriculture.
- continue to participate in national programs and policy committees that address climate change.

4. *The Province should develop and fund a water conservation grant program to provide assistance to producers who implement measures to conserve and protect water supplies.*

The Province will:

- in consultation with the NSFA, investigate the concept of water conservation grants and other means of encouraging industry to implement measures to conserve and protect water supplies.
- support initiatives which will address water resource management issues (e.g. Prairie Farm Rehabilitation Association, Water Task Group).

In conclusion, the response to the 2001 drought will be limited to the above recommendations and applied on a whole farm approach.

BACKGROUND

In 2001, Nova Scotia experienced its fourth year of drought in the last five. Drought conditions have had an adverse effect on farming during this period. In fact, the summer of 2001 has been the driest in decades for much of Canada. Crop yields in many regions of the province are expected to be well below average. Livestock is being sold because of poor pasture conditions and inadequate water and feed.

This report is based on weather data from Environment Canada, and input from various sources. Appended to this report are regional and commodity reports which are based on anecdotal information provided by producers and producer associations. For many crops, yield data are not available at this time. A more thorough analysis on a farm-by-farm basis will be necessary to get an accurate estimate of the total loss due to this years drought.

METHOD OF ASSESSING THE IMPACT OF WEATHER ON AGRICULTURE

The following assessment was based on measured and estimated sources of information including:

- regional assessments of the weather impact on agriculture
- a meeting on the impact of drought on agriculture with the Agricultural Development Institute
- results of a weather impact questionnaire circulated to farmers in September 2001.
- consultation with the Nova Scotia Federation of Agriculture Council of Leaders.
- weather data from Environment Canada.

WEATHER SUMMARY

Based on available weather data it appears that the severity of the drought was variable throughout the province. **Table 1** compares the total rainfall for August 2001 with the 30 year average for several locations throughout the province. It also shows the percentage of the normal rainfall received from May 1 to August 31.

Table 1.

Precipitation for selected locations in Nova Scotia - 2001			
Location	Total for August 2001 (mm)	August Normal Total (30 year) (mm)	% Normal from May 1 (mm)
Yarmouth	87.0	82.2	90.5
Greenwood	14.5	82.5	60.1
Kentville	11.5	90.5	74.7
Parrsboro	33.0	103.0	81.6
Nappan	29.3	88.1	77.0
Truro	7.0	99.6	101.7
Sydney	20.4	97.3	60.9

In comparison with previous years, most areas affected by drought in 2001 received less rain in July and August than the previous four years. **Table 2** illustrates this comparison along with a comparison to the 30-year average rainfall for July and August.

Table 2.

Five-Year Comparison of July to August Rainfall for Selected Sites in Nova Scotia						
Location	1997 Rainfall (mm)	1998 Rainfall (mm)	1999 Rainfall (mm)	2000 Rainfall (mm)	2001 Rainfall (mm)	30-Year Average (mm)
Yarmouth	85.6	126.7	226.6	162.2	153.4	166.9
Greenwood	71.9	135.2	139.2	120.0	55.2	175.0
Kentville	73.6	86.4	146.7	109.0	38.5	172.0
Parrsboro	76.5	126.2	173.8	105.8	52.6	203.3
Nappan	75.6	291.0	151.6	104.2	51.3	185.9
Truro	32.5	158.0	167.7	144.3	86.6	187.3
Sydney	179.3	291.0	219.6	104.2	83.8	183.5

It must be noted that monthly totals and long term totals do not always reflect the true picture as single large rain events, differences in soil type and other factors are not taken into consideration. However, they are the most reliable comparisons from the weather data that was available.

THE IMPACT OF DROUGHT ON AGRICULTURE

The drought impact in 2001 is best described as "variable" and is concentrated within regions and sub sectors. Crop yields in many regions of the province are expected to be well below average. Although individual farms have suffered from the drought throughout the Province, Annapolis, Kings, Cumberland, Colchester, Antigonish and parts of Pictou counties are likely the most affected regions. Hants County, Pictou County, Halifax Regional Municipality and parts of Cape Breton were less severely impacted. Although drought impact was mitigated by irrigation, for some producers, it resulted in significant increases in production costs.

The crops that have suffered the most from drought are potatoes in the Annapolis Valley, blueberries in Cumberland and parts of Colchester (Great Village area) counties and, vegetables in Kings and Annapolis Counties.

Livestock is being sold at lighter market weight because of poor pasture conditions, inadequate water and feed. The NSFA reports that *"because of the relatively high price of cattle it is likely many beef producers will decide to 'cash out' rather than incur more debt."* Production costs are up for most livestock producers due to mitigative actions that have been required to address the drought. The federation reports that *"in most parts of the Province pastures ran out in mid July"*. Although forage production is down by roughly 20% throughout the Province, eastern Nova Scotia (particularly Antigonish area) appears to be most affected. However this may be a combination of drought and army worm damage. *"Insects and disease love heat and drought stressed crops have added to the problems farm businesses are experiencing."* (NSFA)

Access to water was another challenge. In some areas of the Province farmers experienced difficulties obtaining approvals for withdrawal or storage of water. The Department is currently consulting with the Department of Environment and Labour regarding this concern.

Crop Insurance Data

Data gathered by the Crop Insurance Commission also provides information on the affects of drought.

Table 3 provides projections of crop insurance claims by commodity, as well as showing the history of claims in previous years. The claims for blueberries, peas and beans, potatoes, tree fruits and for vegetables are expected to higher than in 2000, and comparable to claims in other drought years. The other comparable drought years were 1997 through 1999.

Table 3

Nova Scotia Crop Insurance Claims History 1996 - 2001						
	1996	1997	1998	1999	2000	(Projected) 2001
Blueberries	\$144,488	\$255,784	\$281,337	\$25,127	\$27,693	\$248,000
Corn	67,199	115,198	24,290	19,645	21,829	15,000
Forage*						4,500
Forage Establishment	2,864	967	294	2,518	748	
Peas / Beans	89,179	50,756	259,434	189,166	11,723	77,000
Potatoes	23,176	30,322	186,364	367,822	0	140,000
Raspberry *					1,721	
Soybeans	6,686	24,640	738	6,909	2,400	4,500
Spring Grain	52,385	68,154	59,858	112,021	58,339	55,000
Strawberries	11,134	9,620	3,609	5,123	12,125	7,700
Tree Fruit	63,573	119,748	84,845	9,114	39,197	95,000
Tree Endorsement		3,346				
Vegetables *					99,223	110,000
Winter Grain	5,158	97,532	29,014	60,013	9,248	7,700
Total	\$465,840	\$776,068	\$929,783	\$797,459	\$284,246	\$764,400
* Plans Introduced in 2000.						

Table 4 provides similar information for forage crops on a regional basis. This again points to a variable situation throughout the province.

It should be noted that drought is not the only factor involved in crop insurance claims. The attached map (Appendix V) also indicates the areas that are expected to have the greatest crop insurance claims.

Table 4

Forage Figures (tonnes/managed acre) Nova Scotia Crop Insurance					
Region		East	Central	West	Province
10-Year Average					2.480
2000	Total	2.623	2.529	2.601	2.570
2001	Total	1.861	1.966	2.225	2.010
Difference		-29.1%	-22.3%	-14.5%	-21.85

**Survey data based on 50 farms*

FARM INCOME FORECAST

On October 12, 2001 Agriculture and Agri-Food Canada released the revised 2001-2005 Farm Income Forecast. At the aggregate industry level, higher livestock prices and receipts are expected to almost offset the lower sales revenue from cash crops which means overall market receipts for 2001 may change little compared with 2000. With higher operating expenses however net returns are expected to decrease by \$15 million or by 32% (after an increase of \$5.6 million in program payments).

The drop in potato receipts used in constructing the forecast is the figure estimated by the industry. The blueberry hit is also within the range being suggested by growers. The overall change in vegetable receipts is harder to discern but while the forecast may have vegetable receipts too high, any correction would not alter the aggregate industry numbers much. Another factor reconciling the estimated 2001 numbers is that part of the impact of the drought will decrease in 2002. Farm cash receipts for 2001 include the sales of stored crops harvested in 2000 and shipped last winter. Also parts of the crop sector (such as strawberries, floriculture, greenhouse vegetables, tree fruit and cereal grains) had years which were similar to 2000. The "hurt" within the crop sector is concentrated within some areas and sub-sectors.

Most of the increase forecast in operating costs this year (+\$15.5 million) arises from higher feed costs (+\$9 million). Fertilizer and lime expenditures are expected to increase by \$1.3 million. Labour and machinery costs are estimated to increase by \$1.5 million for the higher-than-average out-of-pocket costs for irrigation (based on \$250/ac. x 6,000 acres).

Farm Income, Nova Scotia, 2000 and 2001 (Forecast)

	2000	2001 ^{FORECAST}	Change
	\$ 000		
Crop Receipts	141,731	123,082	(18,649)
Livestock Receipts	261,237	279,280	18,043
Market Receipts	402,968	402,362	(606)
Program Payments	12,000	17,602	5,602
Total Cash Receipts	414,937	419,964	5,027
Operating Expenses	327,533	343,057	(15,524)
Depreciation Charges	44,258	45,844	(1,586)
Total Net Income¹	46,296	31,395	(14,901)

¹ Net farm income estimates over the previous five years (1996-2000) averaged \$43.3 million.

Table 5 compares current vegetable prices with last year. Prices for vegetables are comparable between years.

Table 5 Comparison of Vegetable Prices 2000 and 2001

Produce Item	Sept. 13, 2000	Sept. 19, 2001	Oct. 23, 2001	Oct. 31, 2001
	(\$)			
Broccoli, 18 ct.	10.00 - 11.50	13.00 - 15.50	11.50	13.00 - 14.00
Cabbage, Green, 50 lbs.	5.50 - 6.50	11.00 - 15.50	9.50	5.50 - 6.25
Carrots, 24x2	7.50 - 7.75	9.00 - 10.50	9.50	7.00 - 8.00
Lettuce, Head, 24 ct.	17.00 - 18.50	17.50		
Lettuce, Romaine, 24 ct.	15.50 - 17.00	12.50		
Onions, Green, 48 ct.	13.50 - 14.00	14.50		
Onions, Yellow, 24x2	12.50 - 13.00	8.50 - 10.00	8.50	7.50 - 8.75
Potatoes, 50lbs.	5.00 - 5.25	6.00		
Potatoes, 10x5 lbs.	7.75 - 8.00	8.50	10.75	7.00
Rutabagas, 50lbs.	9.50 - 10.00	13.50	11.50	7.50 - 9.00
Squash, Buttercup, 40 lbs.	10.50 - 11.00	9.00 - 12.00	11.50	7.50 - 10.00

Wholesale Paying Prices, Halifax (information supplied by the Canadian Food Inspection Agency)

PROGRAM PARTICIPATION TRENDS AS A MEASURE OF ADDRESSING ECONOMIC HARDSHIPS INCURRED FROM THE DROUGHT: (As of October 25,2001)

Farm Investment Fund:

123 water related projects with a total committed value of \$302,446.00 have been approved.

NISA:

Participants: 1055

Value of account balances: \$22,054,200

Funds Available for withdrawal: \$7,460,482

Actual withdrawals taken: 105 / \$812,761

CFIP:

Interim applications submitted: 20

Crop Insurance:

Crop insurance carries \$14.2 million of insurance this year on 26,000 acres. Details of yield to date are in **Appendix 1**.

ANALYSIS AND RECOMMENDATIONS

Crop yields in many regions of the province are expected to be well below average and livestock is being sold at below market weight because of poor pasture conditions, inadequate water and feed. Lack of water for livestock has been a serious problem. Production costs are up for most horticultural and livestock production due to mitigative actions that have been required due to the drought conditions.

Not all areas of the province are equally affected. Annapolis, Kings, Cumberland, Colchester, Antigonish counties, as well as parts of Pictou County are the most affected. Hants County, Pictou County, Halifax Regional Municipality and parts of Cape Breton Island were somewhat less impacted. The Federation of Agriculture reports that *"horticulture crops that could not be irrigated suffered losses from 50 to 100%. Crops that were irrigated suffered losses in the area of 20 to 25% and a loss in quality."* However, information is not complete as to the amount of irrigated and non-irrigated acreage.

For many crops, yield data are not available at this time. A thorough analysis on a farm by farm basis will be necessary to get an accurate estimate of the total loss due to this years drought.

The Nova Scotia Federation of Agriculture proposes and number of short and long term options to address the impact of weather related losses. The NSFA's options (in italics) and a recommended approach for the Department follows:

Program Options (short term)

1. CFIP negative margin coverage

The Province should cover negative margins for CFIP.

Analysis and Recommendation:

The coverage of negative margins for CFIP is consistent with the approach the department is taking under the current federal/provincial safety net agreement. Negative margin coverage is a fair and equitable way of offering assistance for additional disaster relief. When considering the new framework agreement other approaches, such as covering negative margins under crop insurance, should be investigated.

The Province's cost of covering CFIP negative margins is estimated at \$2.6 million which is in addition to the basic coverage costs of approximately \$1 million.

The Province will:

- provide CFIP negative margin coverage for the 2001 claim year.

2. Assistance for crops not insurable under crop insurance

The Province should provide direct assistance to producers who suffered crop losses where the crop was uninsurable through crop insurance.

Analysis and Recommendation:

The Province currently has a comprehensive list of 34 crops eligible for insurance through the Crop and Livestock Insurance Commission. Those crops currently insured include:

Corn	Blueberry (High bush, Low Bush)
Forage	Raspberry
Peas/Beans (Processing)	Strawberry
Potatoes	Tree Fruit (Apples, Pears)
Soybeans	
Spring Grain (Barley, Oats, Feed Wheat, Milling Wheat, Mixed Grain)	
Winter Grain (Milling Wheat, Feed Wheat, Rye)	
Vegetables (Fresh Carrots, Processing Carrots, Broccoli, Brussels Sprouts, Lettuce, Cabbage, Rutabagas, Winter Squash, Onions, Cauliflower)	

The present safety net programs are whole-farm in approach and do not discriminate against any crop. Safety net programs provide a viable alternative to producers with crops not currently covered by crop insurance.

The Province will:

- consider expansion of the Crop Insurance Programs to include additional crops.

3. Low interest loans

The Province should make low interest loans to eligible producers to replace lost infrastructure, cover increased production costs, reorganize farm businesses and refinance debt.

Analysis and Recommendation:

The agriculture industry needs to maintain an equitable debt ratio.

The Province will:

- encourage the federal government to continue to offer its fall and spring cash advance program.
- continue to offer the agriculture industry competitive loans through the NS Farm Loan Board.
- work with individuals who have faced financial hardship as a result of the drought to address "cash-flow" stresses.
- encourage farmers to make use of the Farm Consultation Service and Farm Debt Mediation Service. These federal programs are designed to deal with "cash flow" problems.

4. Replacement of lost physical infrastructure

The Province should provide up to 50% assistance to rehabilitate land and infrastructure damaged by weather conditions.

Analysis and Recommendation:

The long term impact of the drought on land and infrastructure is yet to be determined. However, it is clear that industry must prepare itself to prevent future water resources crisis.

The Province will:

- place increased emphasis on its farm and public protection programs (eg Farm Investment Fund) which includes environmental and water management.

Program Options (long term)

1. Safety Nets

The Province should set up a formal consultation process on safety nets with the Federation and agree to take a more aggressive approach at the national level with respect to the negotiation of safety net programs that fit Nova Scotia's needs.

Analysis and Recommendation:

Through participation at the national level, provincially, inter-provincially and with stakeholders, we continue to aggressively identify and pursue Nova Scotia's program needs.

The Province will:

- continue to work with industry through the Agriculture Advisory Committee on the design and evaluation of present and future safety net programs.
- continue to support existing safety net programs and increase participation through promotion and awareness.
- explore options within existing safety net programs to address farm income disasters within the Canada/Nova Scotia Agricultural Framework Agreement.
- work to ensure that the next Agricultural Framework Agreement includes the ability to address long term water solutions for Nova Scotia.

2. Water Management Strategy

The Province, in consultation with the industry, should immediately begin work on the development of a water management strategy for agriculture.

Analysis and Recommendation:

The Province recognizes the need to develop a comprehensive water management strategy which addresses the needs of all water users including agriculture.

The Province is:

- working with industry, through such structures as the Growers Water Group, to ensure that the short and long term water resource challenges facing agriculture are considered in provincial water management strategies.
- working to address the specific water management needs of agriculture, under the leadership of a Water Task Group created by the Department.

3. Climate Change

The Province should make an effort to look at future climate change and its implications for agriculture in Nova Scotia as a preliminary step to reorganizing the industry to deal with future weather patterns.

Analysis and Recommendation:

The Province recognizes the important links between climate change, greenhouse gas emissions, soil and water management and agricultural activities. The Province participates in the Agriculture Climate Change Policy Network as well as other national structures dealing with environmental strategies and climate change.

The Province will:

- address climate change through encouraging the adaptation and renewal programs.
- further study the interaction between agriculture and weather in Nova Scotia through the Climate Change Research Chair at the NSAC (the only research chair of this kind in Canada).
- increase predictive climatological research to better estimate the future impact of weather on agriculture.
- continue to participate in national programs and policy committees that address climate change.

4. Water Conservation grants

The Province should develop and fund a water conservation grant program to provide assistance to producers who implement measures to conserve and protect water supplies.

Analysis and Recommendation:

The Province will:

- in consultation with the NSFA, investigate the concept of water conservation grants and other means of encouraging industry to implement measures to conserve and protect water supplies.
- support initiatives which will attract assistance in addressing water resource management issues (e.g. PFRA, Water Task Group).

In summary it is recommended that the response to the 2001 drought impact should be limited to the above recommendations and applied on a whole farm approach.

APPENDIX I

2001 Industry Averages - October 19, 2001 - NS Crop Insurance Commission								
Crop	# Reporting	% Complete	Yield Units	2001 Yr. Avg.	10-Yr. Avg.	2000 Yr. Avg.	% Variance 10-Yr. Avg.	% 2000
Barley	64	77	kg/ha	2517	2776	3114	-9	-19
Oats	28	71	kg/ha	1970	2041	2453	-3	-20
Spring Feed Wheat	7	57	kg/ha	3036	2625	1597	16	90
Spring Milling Wheat	4	100	kg/ha	2357	3319	2529	-29	-7
Mixed Grain	2	100	kg/ha	1048	1821	2361	-42	-56
Winter Feed Wheat	13	85	kg/ha	4200	3004	3815	40	10
Winter Milling Wheat	8	75	kg/ha	3862	4035	4921	-4	-22
Rye Zone 1	4	50	kg/ha	3374	2773	3101	22	9
Soybeans	15	40	kg/ha	1492	1833	2013	-19	-26
Corn	55	18	tonne/ha	4.82	4.06	4.67	19	3
Lowbush Blueberries	146	75	lb/ac	1888	2295	3035	-18	-38
Strawberries	8	75	qts/ac	4437	3964	3339	12	33
Raspberries	2	50	pts/ac	1502	1376	350	9	329
Peas	23	100	lb/ac	2647	2902	3118	-9	-15
Beans	20	100	lb/ac	3126	3746	4662	-17	-33
Potato - Processing	4		cwt/ac	*	201.7	220.4		
Potato - Table Stock	2		cwt/ac	*				
Potato - Seed	2		cwt/ac	*				
Forage Production	46	85		1.97	2.483	2.53	-21	-22
								-5
Tree Fruit	70	0	lb/ac	*				
Vegetables	22	8	units/acre	*				
* Yield Information not yet available								

APPENDIX II WEATHER IMPACT BY REGION

The following summaries of regional reports were provided by the NSFA Council of Leaders during its September 19 and 20, 2001, meetings. Not all counties are represented. The list includes those most impacted by drought, and for which information was provided.

Colchester County: The dry conditions experienced were more severe than in any of the previous four drought years. Second cut hay crops were affected by dry weather as well as army worm damage in some fields. Greenhouse growers experienced 50% lower sales in August. Crop quality was lower due to heat stress.

Lack of water for livestock was also experienced by some producers.

Cumberland County: Hay crops were impacted with no second-cut and third-cut crops. Some farmers began feeding hay in July. Pastures were depleted, and many farmers had to haul water. From other sources, beef producers estimated additional costs of \$100/head.

Blueberry yields are down 75% in the area. There is a good chance that the drought will also affect next years' crop as well due to reduced fruit bud development.

Producers have been hard hit the last four to five years.

Antigonish County: The first cut hay was good. However dry weather (15 mm since mid June) and army worm damage reduce second cut. Pastures were also depleted. It will be necessary to reseed pastures in many cases. It was necessary to feed grain and hay. Many beef herds were being reduced even though average weights were down by 100 lbs/animal. It was estimated that pasture replacement and extra feed would cost an additional \$30,000 for a 60-cow herd.

Pictou County: While conditions were very dry, feed shortage was not as severe because of an excellent first cut and storage carried over from last year although in some locations feeding hay was necessary since mid July. Some areas of the county received some rain and, as a result, damage has been spotty. In the beef sector, average feeder sale weight was down by 38 lbs. The blueberry crop was good in most areas of the county.

Kings County: In general, conditions were very dry. Crops that did not have irrigation were reduced by 50 to 100%. Crops with irrigation had reduced yields but also increased production costs due to the increased frequency of irrigation. Second cut hay was reduced by lack of water and army worm damage. Increased costs of other pests and diseases were also reported.

Annapolis County: Experienced severe drought problems. Grain and forage crops were severely affected. Up to 50% reduction in field crops (e.g. soya beans) was reported. Livestock had to be fed on first cutting hay and silage.

APPENDIX III WEATHER IMPACT BY COMMODITY

The following is a review by commodity group. Comments are taken from estimates of crop damage as reported by the Council of Leaders, Nova Scotia Federation of Agriculture, at its September 19 and 20, 2001, meetings, and a summary of crop loss estimates from the Nova Scotia Crop and Livestock Insurance Commission, with input from ADI and NSDAF staff. Information on crop yields and averages was also obtained from the Nova Scotia Department of Agriculture and Fisheries, Agricultural Statistics.

VEGETABLE CROPS

The vegetable industry represents a diverse variety of crops, with an estimated \$30 million in farm gate sales. The variety of crops, access to irrigation equipment, and varying harvest dates make it difficult to assess the overall impact of drought on this sector. In general there was a greater use of irrigation than in normal years. All crops were strongly affected by the drought but the effect was variable from crop to crop and farm to farm. Those with access to irrigation experienced a 20 to 25% yield loss, plus additional costs for applying irrigation. Growers without irrigation experienced from 50 to 100% crop loss. Access to water and water infrastructure was key to success.

Potato: This crop has been severely damaged. Growers estimated losses of 75% for non-irrigated crop and 35 to 40% loss for irrigated fields. Yield figures are not available at this time. In 2000 the average yield was 220.42 cwt/ac with a 10-year average of 201.75 cwt/ac*. The NSFA stated that the industry supplies one of the most efficient processing operations in North America. Pressure from insect damage has also increased. Irrigation costs are estimated at \$100.00 per acre.

** Figures based on NS Crop Insurance figures.*

Pea/Bean: These crops are not normally irrigated. Growers indicated that they experienced up to 25% loss in peas. Average yields were 2647 lbs/ac this year. This represents an average loss of 9% of the 10-year average* and a 15% reduction* from the 2000 crop. Growers indicated that they experienced losses of 50 to 60% in bean production. The losses were greatest in processing beans. The average yield was 3126 lb/ac. This represents a 17% loss compared to the 10-year average and a 33% loss compared to the 2000 average*. European corn borer pressure was also higher, possibly related to warmer weather conditions.

** Figures based on NS Crop Insurance figures.*

Cole Crops: According to grower estimates, losses of 80 to 100% were noted for broccoli, cauliflower and early cabbage that did not receive irrigation. Loss of quality in these crops was noted even with irrigation. Brussel's sprouts experienced a loss of 20% with irrigation. Last year there were 282 acres of cabbage grown with a farm gate

value of \$715,000.00 and 245 acres of cauliflower with a farm gate value of \$510,000.00. Figures are not available for broccoli or Brussel's sprouts.

Beets: Fields that received irrigation had a 20% reduction in yield. Fields that did not receive irrigation were unmarketable. Last year there were 30 acres of beets grown with a farm gate value of \$90,000.

Carrots: Fresh market carrots that received irrigation did well. Those that did not receive irrigation had reduced yields of 15 to 20%.

Processing carrots had reduced yields of 30 to 40%. The harvest date was delayed. There is a possibility that recent markets will not survive.

Sweet Corn: The loss to sweet corn is estimated at 10%. Quality was also down early in the season. On average, there is about 590 acres of sweet corn grown with an average crop value of \$486,000.00.

Onions: Onions that were grown with irrigation decreased 5 to 10%. There was a 100% loss in fields without irrigation (the number of fields was not indicated). Input costs were also higher. On average there are 535 acres of onions grown with a farm gate value of \$2.6 million.

Lettuce: On average there are 146 acres of lettuce grown with a farm gate value of \$681,000.00. Input costs were increased greatly due to irrigating three times per week.

Rutabaga and Turnip: Early planted fields suffered a 100% loss. Late planted crops may be all right. On average there are 300 acres planted with a farm gate value of \$878,000.00.

Peppers: Blossom end rot caused by calcium deficiency in dry weather and root rot were reported as problems in this crop. There are about 30 acres of peppers grown with an average farm gate value of \$123,000.00.

Pumpkins and Squash: Yield figures are not available, however, fruit size is reported to be small. There are about 195 acres of pumpkins with a farm gate value of \$235,000.00, and 200 acres of squash with a farm gate value of \$400,000.00.

BERRY CROPS

The effect of drought on berry crops is variable depending on the crop and the growing region. There may be serious implications for the 2002 crop year since in most berry crops the fruit buds are formed during the summer previous to fruiting. Plants that are under stress generally produce fewer and weaker fruit buds.

Strawberries: While some yields may have been down by 10 to 15%, the overall 2001 crop was up by 125 over the 10-year average, and 33% over the 2000 crop*. However, post-harvest inputs were increased due to the need to irrigate. Some irrigation was continued into September, twice per week since July in some cases. Fruit bud production, and development of daughter plants could be reduced. The five-year average production is 1964 tons, with a farm gate value of \$3.7 million.

** Figures based on NS Crop Insurance figures.*

Raspberries: Crop yields were up by 9% over the 10-year average*. As with strawberries the effect on next years crop is not known. The five-year average production is 67.6 tons, with a farm gate value of \$263,500.00.

** Figures based on NS Crop Insurance figures.*

Wild Blueberries: Final crop figures are not available, however, reported yields are down by 18% over the 10-year average*. Cumberland County was most severely affected by the drought. Yields were reported by growers to be 40 to 50% lower than yields of two years ago. (Wild blueberries are harvested every two years from individual fields.) Some fields were not harvested. Yarmouth, Pictou and Cape Breton counties had good yields.

Other comments indicated that harvest costs were up by 100% of a normal year. Concern is also for fruit bud development in sprout fields (2002 crop) and the potential loss of markets.

The five-year production average is 15,956 tons and the farm gate value is \$21.3 million.

** Figures based on NS Crop Insurance figures.*

Highbush Blueberries: Crop losses are estimated by growers at 30 to 35%. Concern also about fruit bud development.

TREE FRUITS

Apples: The effect on apples is variable depending on orchard location. Fruit size is smaller and fruit tends to drop quite easily. Growers estimated that the loss is 10 to 20%. Input costs have gone up for pest control. Also, young/dwarf trees had to be irrigated. The average production for apples is 51,570 tons with a farm gate value of \$13.1 million.

OTHER CROPS

Non-edible Horticultural Crops: These include sod and nursery stock. This sector is valued at \$20 million. The cost of production has increased dramatically (irrigation, lost product, replacement). Sales in July, August, and September have been reduced because customers are not growing/planting product. Also, the quality of plant material is down. Irrigation ponds are not re-filling and new ponds are empty. The Industry has been severely impacted by drought. The total estimated additional costs over the last five years is roughly \$500,000.

FIELD CROPS

The effect of the drought on field crops is quite variable, depending on the crop. These crops also impact directly on the livestock sector since they are largely grown to provide feed for livestock. This effect will therefore be echoed in the livestock section.

Cereals: * Winter cereal crops generally fared well. Winter feed wheat had average yields of 4200 kg/ha, an increase of 10% over 2000, and 40% over the 10-year average. Rye yields were up 9% over 2000 and 22% over the 10-year average. Spring feed wheat also showed improved yields which were 16% over the 10-year average and 90% over the 2000 crop. All other cereal crops had decreased yields. Barley yields were 9% below the 10-year average, and 19% below 2000 yields. Oats were 3% below the 10-year average and 20% below 2000 yields. Spring milling wheat yields were 29% below the 10-year average and 7% below 2000. Winter milling wheat was 4% below the 10-year average and 22% below last year. Mixed grain was 42% below the 10-year average and 56% below 2000 yields.

** Figures based on NS Crop Insurance figures.*

Corn: The crop is quite variable; yields of silage corn are estimated to be down by 20% in some areas. Also, the quality is lower due to small cob size.

Forages: In general the first-cut hay was above average. Second-cut hay was severely affected with up to 75% reduction in crop in some fields. Army worm caused damage throughout the province. This acted in combination with the dry weather to reduce the second cut.

Pasture land was also depleted in many areas by mid July. As a result, stored feed had to be utilized. This could result in shortages of feed during the winter. This has also increased production costs for maintaining livestock.

LIVESTOCK

As related above, the reduction in pasture and second-cut hay has affected livestock producers. Producers began utilizing stored feed, including grain to maintain their animals. This has, and will, lead to a reduction in livestock inventories. Some farms have experienced lack of water for the animals daily requirements.

Dairy: Production is based on grass and forage. There was a good first crop of hay and silage. Army worms were a problem in many areas in late June and early July. The most severe damage occurred to second-cut hay. The dry weather that followed did not allow the hay to recover. Pastures were also affected by the same conditions. In many cases pastures will require renovation. The cost of renovation is estimated at \$200/acre for a pasture re-seed.

Pasture replacement/additional feed will cost \$30,000 extra this year for 60 cows. Forages seeded this year were also severely affected resulting in loss of the investment in planting.

Supplemental feeding (at least six weeks) on pasture is depleting the winter forage supply. In many cases producers have been feeding hay since the end of July. The cost of feeding hay for 85 days when they should not be feeding any is a \$28,000 cost.

Beef: Pastures were generally lower in nutrients coming into 2001 and therefore they were stressed quickly with army worms and drought. Hay land had to be fenced, resulting in increased costs. Feeding hay and grain to replace feed normally available in pastures have comparable costs as in the dairy sector.

Producers are liquidating cattle even though animals are down in weight by 100 lbs/animal.

The fact that most livestock will go into winter in poor shape will mean increased costs due to fertility and disease problems.

Pork: There is concern over nation-wide cost. Feed costs will rise, they are normally 60 to 65% of production costs, any increase will cut directly into the profit margin.

Animal health is also a concern, conception rates are down. This is related to problems caused by the inability of equipment to control conditions in production facilities.

Poultry: Poultry producers have also experienced weather-related stress in their birds. As in the pork sector, the inadequacy of equipment to control production conditions has been a problem.

Costs of production are increasing. These include increased feed costs, higher costs to cool barns, and lower production efficiency.

Water usage and availability are also a serious concern.

Sheep: Drought has destroyed pasture and hay land. There is a need for programs to renovate pastures/re-seed. Ponds have dried up, pastures are bare, so they must reduce flock size severely. As an example in the River John, Cumberland County area they have been feeding hay since mid July. It is expected that lambing rates will be reduced from 195% to 145%. As in other sectors the effects are regional, a few spots along coast have not been affected.

Bees: The crop of honey is down by one third to one half. Some beekeepers are feeding bees sugar syrup in August because there was no natural feed. Also, the cost of hauling bees to areas with less drought has created additional costs. Colonies are okay as long as they are being fed enough sugar water. This is an additional cost and could affect the condition of colonies going into the winter. Disease incidence is also higher when colonies are under stress.

APPENDIX IV RISK MANAGEMENT SURVEY SUMMARY (Provincial)

The Risk Management Questionnaire was completed and returned by 321 farmers across the province. This is 13.5% of registered Nova Scotia farmers. The responses can be summarized as follows:

Q1: *"Describe the likely impact of this year's weather conditions on your farm income"*

The majority of producers stated that they are and would be experiencing income losses due to:

- reduced yields
- lower quality produce equaling poor prices
- lost market share due to inability to meet contracts and supply customers
- irrigation expenses
- forage and feed purchases
- weight losses in livestock
- breeding difficulties and heat stress in animals, resulting in lower production and illnesses

Q2: *"What steps did you take to minimize the effects of loss incurred through natural causes?"*

- secondary feed and water sources for livestock
- altered grazing patterns
- supplemented pasture with stored feed
- began irrigation projects, or
- increased irrigation and began expanding water sources (digging & enlarging ponds)
- increased use of fertilizer, pesticide, fungicide and herbicide

Q3: *Program participation (of 321 respondents):*

- 73.8% participate in one or more risk management programs
- 39.56% are in NISA only
- 9.65% are in NISA and used CFIP
- 13.4% are in NISA and Crop Insurance
- 4.36% are in NISA , Crop Insurance and used CFIP
- 2.8% used CFIP only
- 0.3% used CFIP and Crop Insurance

- 3.73% are in Crop Insurance only
- 26.2% of respondents do not participate in any programs

Q4: *"If you do not participate in any of the programs in Question 3, please describe why?"*

- did not have the cash flow to participate in NISA or Crop Insurance
- felt the programs were designed for larger operations than their own
- NISA and CFIP are too complicated
- ineffective in situations of gradually decreasing margins

Q5: *"What kind of long-term solutions are you considering to address the issue of ongoing weather related losses and other risk management challenges?"*

On-farm practices:

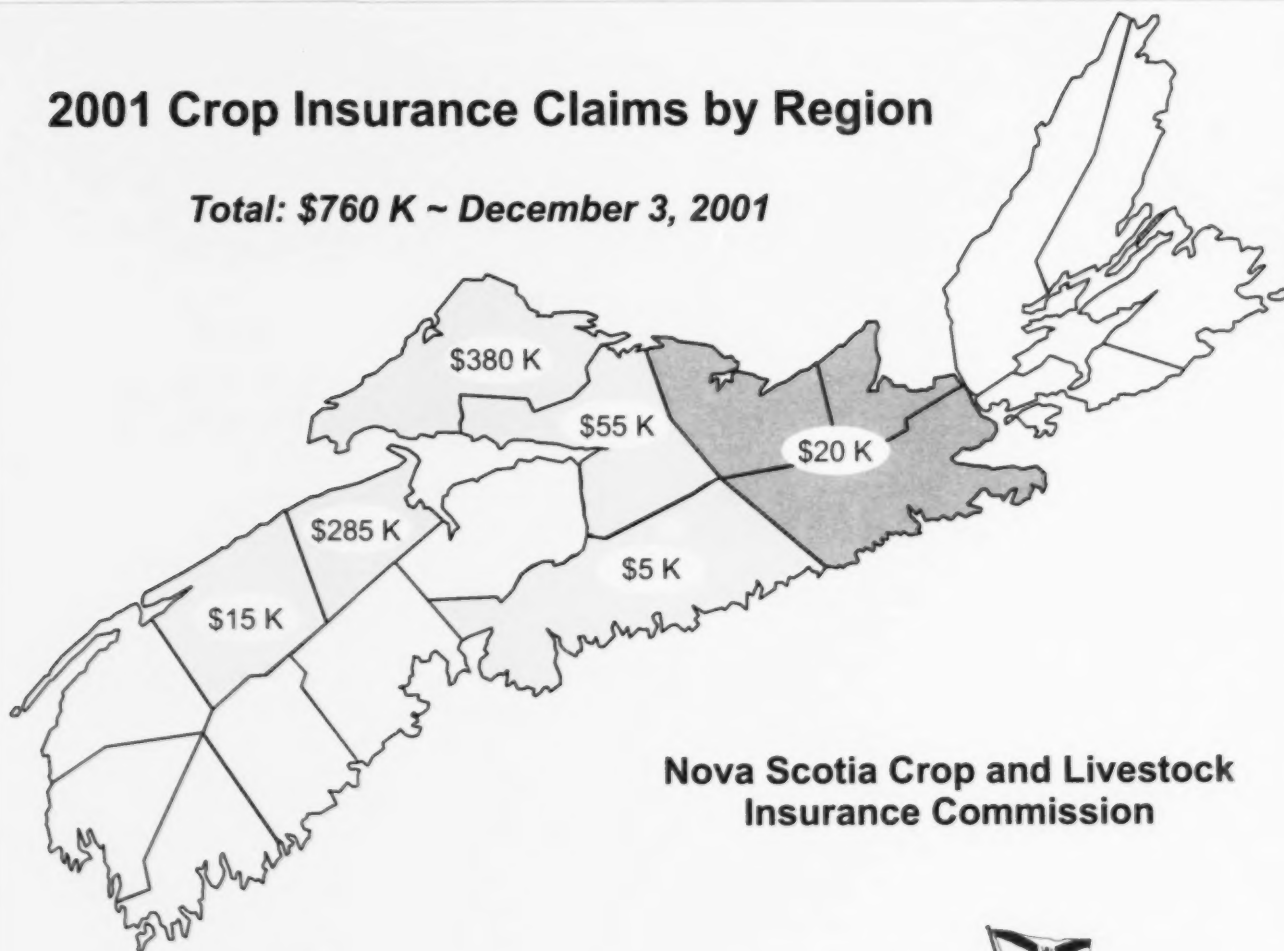
- increasing land base (clearing renting or buying) to ensure future forage/feed sources are adequate.
- seeding of more drought-resistant varieties, crop rotation
- more intensive and rotational grazing to extend season
- cut production, decrease herd size
- well drilling
- irrigation projects
- herd management; altering calving season to reduce pressure on pastures
- adding structures and making changes in existing buildings to reduce heat stress in animals

Financial management:

- investigate and participate in NISA, CFIP Crop Insurance
- borrowed more money or extended line of credit to cover losses and pay for farm improvements
- increased off-farm employment (custom work or got an unrelated off-farm job)
- reduced workforce
- retired

2001 Crop Insurance Claims by Region

Total: \$760 K ~ December 3, 2001



**Nova Scotia Crop and Livestock
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